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EXAMINER	
KITOV, ZEEV V	
ART UNIT	PAPER NUMBER
2836	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/522,906	MCLEOD ET AL.	
	Examiner	Art Unit	
	ZEEV KITOV	2836	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 January 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 - 12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 - 12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Examiner acknowledges a submission of the arguments filed on January 16, 2009. An Office Action follows.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1 – 5, 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Norton et al. (US 4,808,115) in view of Olsson (US 5,949,300) and Fayfield (US 5,644,730). Regarding Claims 1, and 11, Norton et al. disclose a housing of a module (12 in Fig. 1 and 12 in Fig. 3) and connectors (16, 18 in Fig. 1 and 50 in Fig. 3) to the housing (col. 8, line 43 to col. 9, line 44); the connectors (16, 18 in Fig. 1, 50 in Fig. 3) are configured to be coupled to the mother circuit card (20 in Fig. 1 and 3, col. 6, line 63 – col. 7, line 14). Application does not disclose plurality of connectors, it rather discloses a plurality of pins shown in Fig. 3 - 6 and disclosed in [0019] and [0022]. Therefore the connectors may be interpreted as contact pins. The plural connectors (16 in Fig. 1, 50 in Fig. 3) are disposed exterior to the housing (col. 1, lines 14 – 42). Pins of connectors are extended outwardly from the housing (62 in Fig. 3, 4). The connectors being configured to inherently engage at least some sockets of the socket card (20 in

Fig. 1, 3), since it is what the connector is used for. Norton discloses the LRM modules as being itself "a circuit card" or daughter board, which in order to interact with shipboard electrical system is interconnected through a mother circuit board (20 in Fig. 1 and 3, col. 1, lines 14 – 42, col. 6, line 63 – col. 7, line 14), which reads on circuit card.

However, it does not disclose an isolation circuitry within the housing. Olsson discloses the isolation circuitry, such as isolation transformers (25, 27 in Fig. 1) located within the housing (41 in Fig. 1). Olsson also discloses his isolation means being located inside the shielded housing (41 in Fig. 1). The reference is pertinent to the case since it deals with the communication bus wiring connections and particularly discloses isolation of the bus elements. Modification of Norton et al. apparatus according to teachings of Olsson will bring benefits of providing a galvanic DC isolation between the circuit card and peripheral devices and between different peripheral devices interconnected through the circuit card. Such modification will not bring any unusual or unexpected result. Such modification, i.e. use of isolation transformer, was recognized as part of the ordinary capabilities of one skilled in the art as evidenced by numerous US and international patents and textbooks on the subject. Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made to have add the isolation transformers of Olsson to the housing of Norton et al., because (a) it provides a DC galvanic isolation and prevents short-circuiting between the peripheral devices and the circuit card and between different peripheral devices connected together through the circuit card; (b) such isolation is required by MIL-STD-1553 standard and because the Norton system is intended for use in aviation industry (col. 1,

lines 14 – 42) the requirements of this standard are to be met, since otherwise the manufacturer will not be able to sell his substandard equipment, and (c) such isolation is unavoidable when a communication line is a power line. In the Norton et al. system modified according to teachings of Olsson the isolation transformer is located inside the housing since (a) the Olsson transformer is located in the shielded housing (see Olsson Abstract) and (b) according to Norton et al. (see Abstract), a metal shroud of the LRM connector provides EMI shielding. Therefore, there are sufficient preconditions for placing the shielded transformer of Olsson inside the LRM module thus combining two teachings of shielding together. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to set the shielded transformer of Olsson inside the replaceable module of Norton et al. because in such case a substantial saving of space, cost and material will be achieved.

According to Norton, the LRM modules include “a circuit card” or daughter board, which in order to interact with shipboard electrical system is interconnected through a mother circuit board (20 in Fig. 1 and 3, col. 1, lines 14 – 42, col. 6, line 63 – col. 7, line 14), which reads on the circuit card. Therefore, in the Norton system modified according to teachings of Olsson, any particular module similar to LRM will communicate with the shipboard electrical system (the bus) via the circuit card.

In the Norton system modified according to teachings of Olsson, the bus and the circuit card are disposed exterior of the housing (see Norton, the circuit card 20 connected to the bus is disposed exterior to the housing of the module 12).

As to a second plurality of connections (pins) extending outwardly from the module housing and being coupled to the device, Olsson discloses connection of plural channels through their own transformers to the same bus (second transformer (41 on right side) being connected to the same bus (13 in Fig. 1). Such connection inherently requires the second set of the connectors (pins) extending outwardly from the same module housing.

As to coupling the device to the bus, as was stated above, Norton discloses the device (LRM) coupled to the shipboard electrical system, which inherently has the bus, via the circuit card.

However, Norton does not disclose the network bus coupler coupling a bus to a device. Fayfield discloses the bus network interface circuitry disclosed or as adaptive interface card (60 in Fig. 3), which reads on network bus coupler of the claim. According to Fayfield, the bus network interface circuitry provides a means for the binary sensor 20 (device) to couple and communicate with a bus network of the user's choice, i.e. coupling a bus to a device (sensor). The bus network interface circuitry is determined by the bus network type chosen. According to Fayfield, the bus network interface circuitry is embodied in bus network chips that are commercially available for use and well known in the art. Examples of such chips include; Motorola MC68HC05X4 processor chip and chips of some other companies. In the Norton system modified according to teachings of Fayfield, the bus and the circuit card are disposed exterior of the device (module) housing and the network interface circuitry (network bus coupler) is configured

to couple a bus to a device, such as sensor of Fayfield or LRM of Norton, via the circuit card (mother board of Norton).

Applying the Norton LRM design modified according to teachings of Olsson for coupling through the bus interface network to the bus according to teachings of Fayfield will be advantageous for manufacturer of the Norton system because it will provide them with a new application thus expanding their market share.

As well known, at least in this country, the Engineering solutions and inventions are created mostly in private companies, which ultimate goal is to maximize their profits. And as also well known, to achieve this goal the private companies need to expand their market share as much as possible. Therefore, when the company gets a new technical solution protected by the patent (such as Norton and Olsson patents), the salesmen of the company will begin attempting to sell the licenses to every interested side including manufacturers of the Fayfield equipment. Such activity in a case of success would ultimately expand the sales of the patented product and the company's profits. As stated in the Supreme Court Decision *KSR International Co. vs. Teleflex, Inc*. decision (No. 04-1350, slip opinion): "When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one". It is clear that the market forces, i.e. marketing considerations play significant if not decisive role in today's Engineering Design.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the Norton LRM design modified according to teachings of

Olsson for implementing the bus coupler of Fayfield, because it will provide additional applications for the manufacturer of Norton system thus expanding its market share.

Regarding Claim 2, the connectors of Norton et al. (see Fig. 3) have a plurality of pins (562, 54 in Fig. 3).

Regarding Claim 3, the recited connector pins are adapted for insertion into their mating pair (160 in Fig. 3),

Regarding Claim 4, Norton et al. disclose the female connectors (160 in Fig. 3) at the bottom of the circuit card (mother-board in Fig. 3), having the receptive sockets for insertion of pins of the male connector of functional modules (52, 54 in Fig. 3).

Regarding Claim 5, Olsson discloses the isolation element as the isolation transformer (25, 27 in Fig.1). A motivation for modification of the primary reference is the same as above.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brodsky (US 4,833, 600) in view of Olsson (US 5,949,300). As per Claim 12, it differs from Claim 1 rejected above by a limiting term “consisting”. Regarding Claim 12, Brodsky discloses the isolation circuitry, i.e. transformer (90 in Fig. 2, col. 8, lines 25 - 39) electrically coupled to INCOM coupling circuit (22 in Fig. 2), which is located on a circuit board or CONICARD, which reads on the circuit card and which in turn is plugged into IBM processor bus (24 in Fig. 1, col. 6, lines 10 – 28). Therefore, the UNICOM circuit (22 in Fig. 1 and 2) represents a network bus coupler configured to couple a communication bus (20 in Fig. 1 and 2) to a device, i.e. INCOM integrated circuit (U3 in Fig. 1).

However, Brodsky does not disclose the transformer housing. Olsson discloses a housing (41 in Fig. 1) configured to house an electrical isolation circuitry, i.e. transformers. It further discloses data bus connectors (pins) disposed exterior to the transformer housing and being electrically coupled to the isolation circuitry (transformer),. In the Brodsky system modified according to teachings of Olsson, the first plurality of connectors (pins) extending outwardly from the transformer housing. Since the transformer is part of the INCOM circuit (22 in Fig. 1 and 2), which is coupled to CONICARD board (card) shown in Fig. 1, the extensions of some of the connectors (pins) are inherently engaged at least some sockets on the circuit card (CONICARD) connector. Moreover, due to the same reason, the some of the transformer connectors (pins) extending outwardly from the transformer housing are inherently coupled via CONICARD (card) to the bus (20 in Fig. 1 and 2) while some others are coupled via the same CONICARD (card) to the device, i.e. INCOM integrated circuit (U3 in Fig. 1).
It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Brodsky isolation transformer by providing them with a shielding and accordingly with the housing because transformer shielding is necessary due to variety of reasons such as (a) preventing interference between the input and output data streams, (b) preventing EMI problem, and (c) preventing the transformer stray magnetic fields from affecting other adjacent parts located in vicinity.

Claims 7, 8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Norton et al. in view of Olsson. Regarding Claim 7, Norton et al. disclose following

elements of the claim: a modular interconnection structure shown in Fig. 3, the circuit card (20 in Fig. 1 and 3) including plurality of sockets in female connectors (Fig. 3), the modular bus network having a bus coupler (LRM in Fig. 1 and 3) coupled to the circuit card through connectors (16 in Fig. 1 and 50 in Fig. 3). It further discloses plurality of modules having housing (12 in Fig. 1 and 22, 24 in Fig. 2) having a plurality of pins (shown in Fig. 3) disposed exterior of their housing, which are engageable with some of the sockets of connectors (160 in Fig. 3) of the circuit card/mother board (20 in Fig. 1 and 3). The network bus coupler (LRM) is coupling the bus to the device, i.e. the transmitter (optical driver) and the receiver, which inherently present in the system and are connected to the circuit card, since otherwise the optical communication system of the reference is not able to function.

As to a junction box of the claim, according to The Authoritative Dictionary of IEEE Standard Terms (7^{th} Ed.), the junction box is an enclosed distribution panel for connecting or branching one or more corresponding electric circuits without the use of permanent splices. Norton et al. disclose the apparatus having a distribution panel, i.e. circuit board (20 in Fig. 1 and 3) used for connecting one or more corresponding electrical circuits without use of permanent splices. The Norton et al. interconnection system is inherently enclosed, since leaving this equipment without proper housing in the aviation industry environment would be in violation of existing standards. An example of such enclosure is shown in Fig. 1 of Norton et al. showing an enclosure housing the LRM module.

However, Norton et al. does not disclose an isolation circuitry, which is disclosed by Olsson (isolation transformer (25, 27 in Fig. 1). It would be obvious to one of ordinary skill in the art at the time the invention was made to have added the isolation transformers of Olsson to the system of Norton et al., because (a) both Norton and Olsson references deal with avionic systems, and (b) according to Olsson (col. 1, lines 14 - 30), such isolation is required by MIL-STD-1553 standard and since the Norton system is intended for use in aviation industry (col. 1, lines 14 – 42) the requirements of this standard are to be met, otherwise the manufacturer will not be able to sell his substandard equipment. Such modification, i.e. use of transformers for providing DC galvanic isolation was recognized as part of the ordinary capabilities of one skilled in the art.

Regarding Claim 8, Olsson discloses the isolation transformers (see Claim 1 rejection above).

Regarding Claim 10, Olsson discloses an aviation component, since MIL-SRD-1553 standard is the standard specific for an aircraft.

Claims 6 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Norton et al. in view of Olsson, Fayfield and Shaffer (US 5,841,778). Regarding Claim 6, Norton et al. disclose the connectors disposed exterior of the module housing (see Fig. 3). Shaffer discloses a bus terminator (elements 110 and 160 in Fig. 1); the terminators are inherently disposed in the housing and electrically coupled to a connector. In the Norton system modified according to teachings of Shaffer, the

terminators are inherently disposed in the housing and connected to the connectors leading to the communication cables, i.e. located outside the housing. The terminators are to be set inside the housing because setting them outside the housing would require increase in the connections length, which is detrimental for communication at such high frequencies as used in systems like the Norton system. The terminators are inherently connected to the connector since the communication channel is connected to the device (receiver and transmitter) through the connector and the terminator is a connected to the communication channel. It would be obvious to one of ordinary skill in the art at the time the invention was made to have added the terminator elements according to Shaffer to the Norton et al. system, because as well known in the art, it would prevent the signals reflections from the ends. Use of terminations for prevention of signals reflection in the electrical lines was recognized as part of the ordinary capabilities of one skilled in the art.

Regarding Claim 9, Shaffer discloses a bus terminator (elements 110 and 160 in Fig. 1) disposed in the housing and electrically coupled to a connector. A motivation for modificatin of the primary reference is the same as above.

Response to Arguments

Applicant's arguments have been fully considered but they are not persuasive.

1. Applicant attacks the Olsson reference for not disclosing connection of the transformers to the bus line “via a circuit card” (page 7, 2nd paragraph). However, as stated in the Office Action, this feature is disclosed by Fayfield (page 44th paragraph). In

response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

2. Applicant further alleges that Olsson reference teaches away from connecting the transformer to the bus through the circuit card. According to him coupling the transformer to the bus line through resistors represents teaching away from connecting the transformer to the bus line via the circuit card. Applicant apparently confuses two concepts of coupling: (a) electrical schematic level coupling presented as coupling through resistors and (b) architectural level coupling presented as coupling via the circuit card. The same resistors may be positioned in the circuit card, if necessary. There is no any contradiction between these two concepts. Presence of the resistors in the coupling circuit does not prevent or discourage providing the coupling via the circuit card. Therefore, contrary to the Applicant allegation, the Olsson reference does not teach away from providing the coupling to the bus via the circuit card.

3. Applicant further attacks the Norton and Olsson reference for not disclosing coupling via the circuit card: alleges that if the Norton and Olsson teachings were combined together the transformers would be coupled to the bus through the resistors as opposed via the circuit card. However, this allegation is wrong. As was stated in the Office Action (see Claim 1 rejection), Norton discloses the LRM modules including “a circuit card” or daughter board, which in order to interact with shipboard electrical system is interconnected through a mother circuit board (20 in Fig. 1 and 3, col. 1, lines

14 – 42, col. 6, line 63 – col. 7, line 14), which is read on circuit card. Therefore, any particular module similar to LRM will communicate with the shipboard electrical system (the bus) via the circuit card.

4. Applicant attacks a motivation for combining together Norton, Olsson and Fayfield references alleging that they are related to different fields of endeavor. However, all these inventions solve related problems associated with interfacing the device with the bus. Applicant further attacks the Fayfield reference for not disclosing "a network bus coupler". However, as stated in the Office Action (see Claim 1 rejection), Fayfield discloses the bus network interface circuitry coupling the device to the bus.

5. As to Applicant's criticism regarding Brodsky reference, the Examiner provided an expanded explanation as to how this reference discloses the claimed subject matter.

Examiner believes that the instant Response to Arguments covers all the issues raised in the REMARKS by the Applicant.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zeev Kitov whose current telephone number is (571) 272 - 2052. The examiner can normally be reached on 8:00 – 4:30. If attempts to reach examiner by telephone are unsuccessful, the examiner's supervisor, Michael Sherry, can be reached on (571) 272 – 2800, Ext. 36. The fax phone number for organization where this application or proceedings is assigned is (571) 273-8300 for all communications.

/Z. K./

Examiner, Art Unit 2836

3/9/2009

/Stephen W Jackson/
Primary Examiner, Art Unit 2836